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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/026,935

12/18/2001

Alan Sullivan

30231/40

7292

7590

09/19/2006

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EXAMINER

TRAN, TAM D

ART UNIT

PAPER NUMBER

2628

DATE MAILED: 09/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/026,935	<b>Applicant(s)</b> SULLIVAN ET AL.	
	<b>Examiner</b> Tam D. Tran	<b>Art Unit</b> 2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 92-159 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 94,95,99-101 and 131-159 is/are allowed.
- 6) ☒ Claim(s) 92, 93, 96, 97, 98, 102-130 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 101*

1. Claims 92, 93, 96, 97, 98, 102-130, rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. A useful, concrete and tangible result must be either specifically recited in the claim or flow inherently therefrom.

### *Allowable Subject Matter*

2. Claims 94, 95, 99-101, 131-159, are allowed.

3. The following is a statement of reasons for the indication of allowable subject matter: The closest prior art shows an apparatus for generating a three-dimensional volume projection image of an object, the apparatus having cubic frame buffer but does not disclose a system of assigning a location in the frame buffer for the three dimensional image data in accordance with the equation:

$$\text{Addr} = N_{\text{sub.b/p}} * (x + N_{\text{sub.x}} * y + N_{\text{sub.x}} * N_{\text{sub.Y}} * z_{\text{sub.i}})$$
 wherein Addr is the assigned memory location in the multiplanar frame buffer for image data having coordinates (x, y, z),  $N_{\text{sub.b/p}}$  is the number of bytes of information stored for each pixel,  $N_{\text{sub.x}}$  is the number of pixels in the x direction of a display,  $N_{\text{sub.Y}}$  is the number of pixels in the y dimension of a display, and  $Z_{\text{sub.i}}$  is an integer portion of the scaled z-coordinate value.

Art Unit: 2628

The closest prior art shows an apparatus for generating a three-dimensional volume projection image of an object, the apparatus having cubic frame buffer but does not disclose a system of assigning a location in the frame buffer for the three dimensional image data in accordance with the equation:  $\text{Addr} = N.\text{sub.B/P} * (r * \cos(\theta) + N.\text{sub.r} * y' + N.\text{sub.r} * N.\text{sub.y}' * r * \sin(\theta))$  wherein Addr is the assigned memory location in the multiplanar frame buffer for image data having coordinates (r, y' and theta), N.sub.B/P is the number of bytes of information stored for each pixel, N.sub.r is the number of pixels in the r direction of a display, N.sub.y' is the number of pixels in the y dimension of the three-dimensional volumetric display.

The closest prior art shows an apparatus for generating a three-dimensional volume projection image of an object, the apparatus having cubic frame buffer but does not disclose a step of discarding the three dimensional image data associated with a second pixel if the transparency information associated with a first pixel indicates that the first pixel is opaque, when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel.

The closest prior art shows an apparatus for generating a three-dimensional volume projection image of an object, the apparatus having cubic frame buffer but does not disclose a step of modulating the color information / brightness information associated with a second pixel based on the transparency information associated with a first pixel,

Art Unit: 2628

when the first pixel and the second pixel have the same (x,y) coordinate values, and the z-coordinate value associated with the second pixel indicates that the second pixel is behind the first pixel.

The closest prior art shows an apparatus for generating a three-dimensional volume projection image of an object, the apparatus having cubic frame buffer but does not disclose a three-dimensional image display system for displaying a three-dimensional image on a three-dimensional volumetric display comprising: computing memory addresses in the multiplanar frame buffer for the three-dimensional image data using the coordinate information and information as to pixel dimensions of the three-dimensional volumetric display, each of said memory addresses corresponding to a pixel to be displayed.

### ***Conclusion***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Tam D. Tran** whose telephone number is

**571-272-7793**. The examiner can normally be reached on MON-FRI from 8:30 – 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Kee M. Tung** can be reached on **571-272-7794**. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2628

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tam Tran

  
Examiner

Division 2628



KEE M. TUNG  
SUPERVISORY PATENT EXAMINER